

REMARKS

Claims 1-24 were pending in this application.

Claims 1-3, 6, 7, 9, 10, 12, 13, 15, 16, 18, 19, and 22-24 have been rejected.

Claims 4, 5, 8, 11, 14, 17, 20, and 21 have been objected to.

Claims 1, 9, 15, and 22 have been amended as shown above.

Claims 1-24 remain pending in this application.

Reconsideration and full allowance of Claims 1-24 are respectfully requested.

I. ALLOWABLE CLAIMS

The Applicants thank the Examiner for the indication that Claims 4, 5, 8, 11, 14, 17, 20, and 21 would be allowable if rewritten in independent form to incorporate the elements of their respective base claims and any intervening claims. Because the Applicants believe that the remaining claims in this application are allowable, the Applicants have not rewritten Claims 4, 5, 8, 11, 14, 17, 20, and 21 in independent form.

II. REJECTION UNDER 35 U.S.C. § 103

The Office Action rejects Claims 1-3, 7, 9, 10, 13, 15, 16, 19, 22, and 23 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent Publication No. 2004/0024568 to Eryurek et al. ("*Eryurek*") in view of U.S. Patent Publication No. 2003/0216888 to Ridolfo ("*Ridolfo*"). The Office Action rejects Claims 6, 12, 18, and 24 under 35 U.S.C. § 103(a) as being unpatentable over *Eryurek* and *Ridolfo* in view of U.S. Patent No. 5,646,600 to Abdel-Malek et al. ("*Abdel-*

Malek”). These rejections are respectfully traversed.

In *ex parte* examination of patent applications, the Patent Office bears the burden of establishing a *prima facie* case of obviousness. (*MPEP* § 2142; *In re Fritch*, 972 F.2d 1260, 1262, 23 U.S.P.Q.2d 1780, 1783 (Fed. Cir. 1992)). The initial burden of establishing a *prima facie* basis to deny patentability to a claimed invention is always upon the Patent Office. (*MPEP* § 2142; *In re Oetiker*, 977 F.2d 1443, 1445, 24 U.S.P.Q.2d 1443, 1444 (Fed. Cir. 1992); *In re Piasecki*, 745 F.2d 1468, 1472, 223 U.S.P.Q. 785, 788 (Fed. Cir. 1984)). Only when a *prima facie* case of obviousness is established does the burden shift to the Applicant to produce evidence of nonobviousness. (*MPEP* § 2142; *In re Oetiker*, 977 F.2d 1443, 1445, 24 U.S.P.Q.2d 1443, 1444 (Fed. Cir. 1992); *In re Rijckaert*, 9 F.3d 1531, 1532, 28 U.S.P.Q.2d 1955, 1956 (Fed. Cir. 1993)). If the Patent Office does not produce a *prima facie* case of unpatentability, then without more the Applicant is entitled to grant of a patent. (*In re Oetiker*, 977 F.2d 1443, 1445, 24 U.S.P.Q.2d 1443, 1444 (Fed. Cir. 1992); *In re Grabiak*, 769 F.2d 729, 733, 226 U.S.P.Q. 870, 873 (Fed. Cir. 1985)).

A *prima facie* case of obviousness is established when the teachings of the prior art itself suggest the claimed subject matter to a person of ordinary skill in the art. (*In re Bell*, 991 F.2d 781, 783, 26 U.S.P.Q.2d 1529, 1531 (Fed. Cir. 1993)). To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references

when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed invention and the reasonable expectation of success must both be found in the prior art, and not based on the Applicant's disclosure. (*MPEP* § 2142).

The Advisory Action states that "one skilled in the art would take XLevel (Level= Level 1, Level 2, ..., Level 7) as the equivalent of the indicators recited in claims 1, 9, 15, 22 and 24 of the instant application, and the 'Level' as the equivalent of a plurality of indexes associated with the resolution levels recited in these claims." (*Advisory Action, Page 2*).

It is unclear what exactly the Advisory Action is referring to when it recites "XLevel (Level= Level 1, Level 2, ..., Level 7)" and "the 'Level.'" The Applicants note that *Eryurek* refers to "components $X_1, X_2, X_3, X_4, \dots X_N$," which the Advisory Action may be referring to as "XLevel." The Applicants also note that *Eryurek* refers to seven "decomposition levels," one of which the Advisory Action may be referring to as "the 'Level.'" However, the "components $X_1, X_2, X_3, X_4, \dots X_N$ " of *Eryurek* are the signal components shown in the seven "decomposition levels" in Figure 5 of *Eryurek*.

Eryurek specifically recites that a signal preprocessor 150 "isolates signal components" in a "sensor signal." (*Par. [0020]*). *Eryurek* also specifically recites that the signal preprocessor 150 is "configured to isolate signal components" using "signal processing techniques" such as wavelet analysis. (*Par. [0022]*). One type of wavelet analysis is shown in Figure 5, which illustrates how a sensor signal S is decomposed into signal components in seven "decomposition levels." (*Pars. [0025]-[0027]*). *Eryurek* further specifically recites that all decomposition levels or only those decomposition levels related to a vibration signal are provided to a signal evaluator

154. (*Par. [0028]*). The signal evaluator 154 compares an isolated signal component to a threshold to determine if a problem exists. (*Par. [0028]*). Figures 6A and 6B illustrate how the signal preprocessor 150 and the signal evaluator 154 operate. (*Par. [0020]*).

Based on this, it is clear that the “components $X_1, X_2, X_3, X_4, \dots X_N$ ” shown and described with reference to Figure 6B of *Eryurek* refer to the isolated signal components at the seven “decomposition levels” in Figure 5 of *Eryurek*. In other words, Figure 5 of *Eryurek* illustrates the “components $X_1, X_2, X_3, X_4, \dots X_N$,” where the “components $X_1, X_2, X_3, X_4, \dots X_N$ ” are represented by the signal components in Level 1 through Level 7 of Figure 5. As a result, the “components $X_1, X_2, X_3, X_4, \dots X_N$ ” of *Eryurek* and the signal components in the seven “decomposition levels” of *Eryurek* represent the same elements.

To the extent that the Office Action relies on the “components $X_1, X_2, X_3, X_4, \dots X_N$ ” and the seven “decomposition levels” of *Eryurek* as anticipating both the “one or more indicators” and the “plurality of indexes” recited in Claims 1, 9, 15, and 22, this is improper. The Office Action cannot rely on the exact same elements of *Eryurek* as anticipating both the “one or more indicators” and the “plurality of indexes” recited in Claims 1, 9, 15, and 22. Similarly, to the extent that the Office Action relies on the “components $X_1, X_2, X_3, X_4, \dots X_N$ ” and the seven “decomposition levels” of *Eryurek* as anticipating both the “one or more indicators” and the “one or more indexes” recited in Claim 24, this is also improper. The Office Action cannot rely on the exact same elements of *Eryurek* as anticipating both the “one or more indicators” and the “one or more indexes” recited in Claim 24.

The “components $X_1, X_2, X_3, X_4, \dots X_N$ ” and the seven “decomposition levels” of

Eryurek can be relied upon only as anticipating either the “one or more indicators” or the “indexes” recited in Claims 1, 9, 15, 22, and 24. The “components $X_1, X_2, X_3, X_4, \dots X_N$ ” and the seven “decomposition levels” of *Eryurek* cannot be relied upon as anticipating both the “one or more indicators” and the “indexes” recited in Claims 1, 9, 15, 22, and 24.

If the “components $X_1, X_2, X_3, X_4, \dots X_N$ ” and the seven “decomposition levels” of *Eryurek* are relied upon as anticipating the “one or more indicators” of a possible valve defect, the Office Action cannot show that *Eryurek* generates a “plurality of indexes ... based on the one or more indicators” as recited in Claims 1, 9, 15, and 22. The Office Action also cannot show that *Eryurek* generates “one or more indexes” as recited in Claim 24.

Eryurek clearly recites that the “components $X_1, X_2, X_3, X_4, \dots X_N$ ” and the seven “decomposition levels” are compared to “thresholds” to determine if a problem exists. Values of the thresholds are not based on the “components $X_1, X_2, X_3, X_4, \dots X_N$ ” or the seven “decomposition levels” of *Eryurek* in any way. As a result, the thresholds of *Eryurek* cannot possibly anticipate a “plurality of indexes” that are generated “based on the one or more indicators” as recited in Claims 1, 9, 15, and 22. Also, the thresholds of *Eryurek* are not based in any way on one or more “stiction patterns” identified using the “components $X_1, X_2, X_3, X_4, \dots X_N$ ” or the seven “decomposition levels” of *Eryurek*. As a result, the thresholds of *Eryurek* cannot possibly anticipate generating “one or more indexes” associated with one or more “stiction patterns” as recited in Claim 24.

If the “components $X_1, X_2, X_3, X_4, \dots X_N$ ” and the seven “decomposition levels” of *Eryurek* are relied upon as anticipating the “indexes,” the Office Action cannot show that the

“components $X_1, X_2, X_3, X_4, \dots X_N$ ” and the seven “decomposition levels” of *Eryurek* are based on “one or more indicators” of a possible valve defect “at each of a plurality of resolution levels” as recited in Claims 1, 9, 15, and 22. The Office Action also cannot show that the “components $X_1, X_2, X_3, X_4, \dots X_N$ ” and the seven “decomposition levels” of *Eryurek* are associated with one or more “stiction patterns,” which are identified using “one or more indicators” of a possible valve defect as recited in Claim 24.

The “components $X_1, X_2, X_3, X_4, \dots X_N$ ” and the seven “decomposition levels” of *Eryurek* represent components of a single decomposed signal. In contrast, Claims 1, 9, 15, and 22 recite that the “plurality of indexes” are based on “one or more indicators” at each of a “plurality of resolution levels.” If the Office Action relies on the “components $X_1, X_2, X_3, X_4, \dots X_N$ ” and the seven “decomposition levels” of *Eryurek* as anticipating the “plurality of indexes,” the Office Action must show a separate element of *Eryurek* that anticipates the “one or more indicators” at each of a “plurality of resolution levels” as recited in Claims 1, 9, 15, and 22. The Office Action cannot make this showing.

The “components $X_1, X_2, X_3, X_4, \dots X_N$ ” and the seven “decomposition levels” of *Eryurek* are generated by decomposing a single “sensor signal.” (*Pars. [0020]-[0025]*). The single sensor signal of *Eryurek* cannot possibly anticipate “one or more indicators” of a possible valve defect “at each of a plurality of resolution levels” as recited in Claims 1, 9, 15, and 22. The single sensor signal of *Eryurek* also cannot possibly anticipate one or more “stiction patterns” that are identified using “one or more indicators” of a possible valve defect as recited in Claim 24.

Eryurek is crystal clear – a single sensor signal S is decomposed into multiple signal components at multiple decomposition levels. Some or all of the signal components are then compared to threshold values. If a threshold is exceeded, *Eryurek* identifies a potential problem. *Eryurek* never discloses, teaches, or suggests identifying “one or more indicators” of a possible valve defect “at each of a plurality of resolution levels” and then generating a “plurality of indexes” that are “based on the one or more indicators” as recited in Claims 1, 9, 15, and 22. *Eryurek* also never discloses, teaches, or suggests identifying “one or more indicators” of a possible valve defect and then generating “one or more indexes” (where the one or more indexes are associated with one or more “stiction patterns” identified using the one or more indicators) as recited in Claim 24.

For these reasons, the Office Action has not established a *prima facie* case of obviousness against Claims 1, 9, 15, 22, and 24 (or their dependent claims). Accordingly, the Applicants respectfully request withdrawal of the § 103 rejections and full allowance of Claims 1-3, 6, 7, 9, 10, 12, 13, 15, 16, 18, 19, and 22-24.

III. CONCLUSION

The Applicants respectfully assert that all pending claims in this application are in condition for allowance and respectfully request full allowance of the claims.

SUMMARY

If any issues arise, or if the Examiner has any suggestions for expediting allowance of this application, the Applicants respectfully invite the Examiner to contact the undersigned at the telephone number indicated below or at *wmunck@davismunck.com*.

The Applicants have included the appropriate fee to cover the cost of a REQUEST FOR CONTINUED EXAMINATION. The Commissioner is hereby authorized to charge any additional fees connected with this communication (including any extension of time fees) or credit any overpayment to Deposit Account No. 50-0208.

Respectfully submitted,

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